Date: March 2, 2012

Subject: Microbiology Data Validation (Dimock – Week 4)

From: Dave Russell, USEPA Region 3, Microbiology Certification Officer

---

Overview

The Week 4 sample batch consists of 17 samples analyzed by Northeastern Environmental Laboratories, Inc., Scranton, PA, for the following parameters:

Parameter	Analytical Method
Total Coliforms (TC)	SM 9222B
Fecal Coliforms (FC)	SM 9222B + SM 9221E
Heterotrophic Bacteria Count (HPC)	SM 9215C

Data quality was reviewed based on the criteria set forth in *Standard Methods for the Examination of Water and Wastewater*, 20th Edition, and the *USEPA Manual for the Certification of Laboratories Analyzing Drinking Water*, 5th Edition, *Chapter 5 – Critical Elements for Microbiology*. Data quality problems are listed below.

Summary

There are several data quality issues associated with Week 3 samples. Cooler transport temperature was not documented for 7 of the 17 samples and consequently the total coliform, fecal coliform and HPC results for those samples may be biased high. The 8-hour HPC holding time for 15 of the 17 samples was exceeded, one field blank was contaminated affecting the HPC results for 6 samples, a media positive control was not performed, and most importantly, HPC method blanks (sterility controls) were not performed with each set of samples plated. The absence of method blanks means the HPC results of all 17 samples cannot be validated. The impact of the other issues noted is discussed below. Data qualifications are provided in Table 1 under Conclusions.

Data Quality Issues

1. TC/FC and HPC Transport Temperatures: For total coliforms, fecal coliforms, and HPC, the cooler transport temperature was in compliance with the <10°C requirement for 10 of the 17 samples. For the 7 samples out of compliance (highlighted in gray below), cooler temperature was not recorded on the COC. Without documentation of the transport temperature, it must be assumed samples were not adequately cooled during transport. Any quantitative results (TC/FC or HPC) from the highlighted samples may therefore be biased high.

FB16	HW03	HW11	HW27Z	HW55	HW58
FB17	HW03Z	HW11P	HW53	HW57	HW59
FB18	HW07	HW27	HW53P	HW57P	

2. HPC Holding Times: The 8-hour holding time for HPC was exceeded for 15 of the 17 samples. Those samples exceeding the holding time are highlighted in gray below. Depending on other water quality factors an extended holding time may cause the number of bacteria present to increase, decrease, or remain unchanged. Results therefore are estimates and may be biased high, low, or not affected.

FB16	HW03	HW11	HW27Z	HW55	HW58
FB17	HW03Z	HW11P	HW53	HW57	HW59
FB18	HW07	HW27	HW53P	HW57P	

3. HPC Method Blanks: A method blank (or agar sterility control plate) was not included with each series of samples plated. Consequently, without a clean method blank showing no growth, the HPC results obtained could be due to contamination of a sample during analysis at the bench. The results (of samples in gray) cannot be validated.

FB16	HW03	HW11	HW27Z	HW55	HW58
FB17	HW03Z	HW11P	HW53	HW57	HW59
FB18	HW07	HW27	HW53P	HW57P	

4. HPC Agar Positive Control: No agar batch positive control results were provided in the QC data package. Results for all samples (highlighted below in gray) are affected and may be biased low, especially results indicating <1 CFU/mL.

FB16	HW03	HW11	HW27Z	HW55	HW58
FB17	HW03Z	HW11P	HW53	HW57	HW59
FB18	HW07	HW27	HW53P	HW57P	

Conclusions

Table 1. presents the final data qualifications for Week 4 samples where they apply. The number in parentheses corresponds to the data quality issue discussed above. (The numbers are not related to issues listed in other data validation reports.)

Table 1. Data Qualifiers -- Week 4

SAMPLE	QUALIFIERS for TC/FC DATA	QUALIFIERS for HPC DATA
FB16		R (3)
FB17	K(1)	R (3)
FB18		R (3)
FB03	K(1)	R (3)
HW03Z	K(1)	R (3)
HW07		R (3)
HW11		R (3)
HW11P		R (3)
HW27		R (3)
HW27Z		R (3)
HW53		R (3)
HW53P		R (3)
HW55		R (3)
HW57	K(1)	R (3)
HW57P	K(1)	R (3)
HW58	K(1)	R (3)
HW59	K(1)	R (3)